

REMARKS

Claims 1 has been amended to correct a typographical error. Claim 5 has been amended as suggested by the Examiner in response to the objection as set forth at page 2 of the Office Action. There is no change in claim scope.

Entry of the amendments and review and reconsideration on the merits are requested.

Claims 1, 3-6 and 8-10 were rejected under 35 U.S.C. § 102(b) as being anticipated by each of U.S. Patent 3,282,875 to Connolly et al, U.S. Patent 5,281,680 to Grot, GB 1,034,197 (GB ‘197) and JP 6-157,675 to Atsushi et al (JP ‘675). The Examiner considered the respective references as meeting each of the terms of the rejected claims, including copolymerization of the claimed monomers in the presence of a saturated perfluoroalkane.

Claims 2 and 7 were rejected under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over each of Connolly et al, Grot, GB ‘197 and JP ‘675. Because the prior art and the present invention are said to recite substantially identical fluorinated sulfonyl-containing copolymers, which may be polymerized in the same process using the same type of perfluorinated solvent as a polymerization medium, the Examiner considered that the prior art methods would inherently meet the physical properties as claimed in claims 2 and 7.

Applicants traverse, and respectfully request the Examiner to reconsider in view of the Declaration evidence submitted herewith and the following remarks.

The invention of claim 1 is directed to a method for producing a fluorocopolymer which comprises a polymerization reaction of a fluorine-containing ethylenic monomer with at least one fluorovinyl ether derivative. Importantly, the polymerization reaction is carried out in a

saturated perfluorohydrocarbon while additional feeding of said fluorine-containing ethylenic monomer and said fluorovinyl ether derivative being carried out.

The above-noted limitation of present claim 1 is not disclosed by any of the cited prior art, and for this reason alone it is respectfully submitted that the present claims define novel subject matter. The significance of this limitation is discussed below, in reference to the description in the specification and the comparative test data presented in the Rule 132 Declaration submitted herewith, as follows.

As described at page 7, lines 17-25 of the specification:

By carrying out the above additional feeding, it becomes possible to maintain the concentration ratio between the fluorine-containing ethylenic monomer and the fluorovinyl ether derivative (hereinafter referred to as "monomer concentration ratio") in the reaction system at a constant or almost constant level. When the monomer concentration ratio is maintained constant or almost constant, a fluorocopolymer whose polymer chains are the same or close in composition and/or molecular weight one another can be produced.

Moreover, as described bridging pages 11-12 of the specification:

In accordance with the method for producing a fluorocopolymer according to the present invention, the polymerization reaction is carried out in a saturated perfluorohydrocarbon showing low affinity for the fluorovinyl ether derivative and, therefore, the fluorocopolymer obtained is low in solubility or swellability and readily precipitate out, hence the viscosity of the reaction solution will not increase. Therefore, supposedly, the concentrations of monomers, polymerization initiator, chain transfer agent and so forth, the heat transfer rate and heat release rate and other factors in the reaction mixture are maintained constant or almost constant and the polymerization reaction thus can proceed in one polymerization field. Further, it is considered that the effects of the additional feeding carried out for minimizing the change in monomer concentration ratio are additionally produced, with the result that fluorocopolymers whose composition distribution and molecular weight distribution are minimized can be obtained in high yields.

As mentioned above, the requisite “additional feeding” is not at all described in the polymerization methods disclosed by the cited prior art, and the Office Action also does not address this critical limitation of claim 1. Moreover, the cited prior art fails to teach or suggest the significance or desirability of the required “additional feeding” as claimed and described in the above-noted passages of the specification. Thus, there is nothing in the cited prior art which would lead one skilled in the art to modify the prior art techniques to incorporate the required “additional feeding” such that the present claims are also patentable over the cited prior art.

The unexpected advantages of the present invention in connection with the claimed “additional feeding” are demonstrated in the executed Declaration Under Rule 132 of Tadaharu Isaka, submitted herewith.

In the comparative testing presented in the Declaration, fluorocopolymers were prepared either in accordance with the method of the present invention (Examples 2 and 4 of the present specification) or *without* additional feeding of PSFS (perfluoro(ethyl vinyl ether) sulfonyl fluoride) as set forth at pages 2-4 of the Declaration (Comparative Examples A and B). The resulting fluorocopolymers were evaluated with respect to MFR and fusion peak area in DSC, the results of which are set forth in Table 1 at page 5 of the Declaration. The test results, reproduced below, show that by carrying out the polymerization reaction in conjunction with “additional feeding” of the fluorine-containing ethylenic monomer and the fluorovinyl ether derivative, the present invention provides a product whose composition distribution and molecular weight distribution are minimized. On the other hand, the fluorocopolymer obtained in Comparative Examples A and B (production of fluorocopolymer *without* additional feeding of PSFS) did not provide so excellent a composition distribution and molecular weight distribution as in the case of the present invention.

For the above reasons, and further in view of the comparative test data presented in the Declaration, it is respectfully submitted that the present claims are neither anticipated nor obvious over the cited prior art, and withdrawal of the foregoing rejections is respectfully requested.

Withdrawal of all rejections and allowance of claims 1-10 is earnestly solicited.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Abraham J. Rosner
Registration No. 33,276

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

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